

EXHIBIT K

IN THE UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF OHIO
EASTERN DIVISION

IN RE: E.I. DU PONT DE NEMOURS AND
COMPANY C-8 PERSONAL INJURY
LITIGATION

CASE NO. 2:13-MD-2433

JUDGE EDMUND A. SARGUS, JR.

MAGISTRATE JUDGE ELIZABETH P.
DEAVERS

This document relates to: Carla Marie Bartlett v. E. I. du Pont de Nemours and
Company, Case No. 2:13-cv-170.

John M. Wolf v. E. I. du Pont de Nemours and
Company, Case No. 2:14-cv-095.

DECLARATION OF DAVID L. MACINTOSH, SCD, CIH

I, David L. MacIntosh, declare and state as follows:

1. I prepared the Expert Report of David L. MacIntosh, dated December 8, 2014 ("Expert Report") and a true and accurate copy is attached as Exhibit 1.
2. Each of the opinions in the Expert Report is stated to a reasonable degree of medical certainty, and was arrived at using reliable methods.
3. If called as a witness, I would testify competently to the matters stated in the Expert Report.
4. I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Dated: May 11, 2015



David L. MacIntosh, SCD, CIH

EXHIBIT 1

CONFIDENTIAL SUBJECT TO MDL PROTECTIVE ORDER

EXPERT REPORT IN

Carla Bartlett v. E. I. du Pont de Nemours and Company, Case No. 2:13-cv-170 (S.D. Ohio)
John Wolf v. E. I. du Pont de Nemours and Company, Case No. 2:14-cv-545 (S.D. W.Va.)

David L. MacIntosh, ScD, CIH

Prepared for:

Plaintiffs' Steering Committee

In re: E. I. du Pont de Nemours & Co. C-8 Personal Injury Litigation, MDL 2433

Case No. 2:13-md-2433 (S.D. Ohio)



By: _____
David L. MacIntosh, ScD

Date: December 8, 2014

1.0 INTRODUCTION

This report describes my analysis of the case materials, including information and data related to evaluating whether Plaintiffs Carla Bartlett and John Wolf meet the exposure criteria for qualifying as “Class Members” under the Class Action Settlement Agreement approved by the Court in 2005 in *Jack W. Leach, et al v. E. I. du Pont de Nemours and Company*, Civil Action No. 01-C-608 (Wood City W. Va. Cir. Ct.) (the “Leach Case”) based upon their specific, individual exposures to a chemical known as PFOA (also known as C8).

2.0 QUALIFICATIONS

I am Chief Science Officer and Director of Advanced Analytics at Environmental Health & Engineering, Inc. (EH&E) in Needham, Massachusetts, and have over 20 years of experience in public health, specializing in environmental and occupational health. My Advanced Analytics practice focuses on design, development, and implementation of systems that support data driven decisions for EH&E’s clients. As needed, I direct or participate in teams of contributors with expertise in engineering, computer science, statistics, medicine, meteorology, chemistry, and other fields.

My professional activity focuses on assisting government, commercial, and non-government organizations with programs to identify, evaluate, and control risks to public health. I have completed projects for federal organizations, such as the U.S. Environmental Protection Agency, U.S. Consumer Product Safety Commission, and the U.S. Department of Transportation. I have also provided support to numerous state and local government organizations, including the State of North Carolina, Brevard County in Florida, and various cities, towns, and school systems. My work with commercial organizations includes centers of higher education such as the University of Washington, University of Tennessee, and University of Cincinnati; healthcare providers such as Brigham and Women’s Hospital, Boston Children’s Hospital, Children’s Medical Center Dallas, and Steward Health Care; biotechnology firms such as Boston Scientific; product manufacturers such as Reckitt-Benckiser, 3M, and Trane; as well as law firms. I routinely advise non-governmental organizations, and in recent years I worked with the American Lung Association, Asia-Pacific Economic Cooperative, and Transportation Research Board of the National Academies of Science.

In addition to my position with EH&E, I am an Adjunct Associate Professor of Environmental Health at the Harvard School of Public Health (HSPH) where each fall I teach a course to graduate students entitled, *Fundamentals of Human Environmental Exposure Assessment*. I also contribute to research being conducted by doctoral degree candidates at HSPH. In addition, I am also presently teaching a graduate student course at Northeastern University entitled, *Biostatistics in Public Health*. Prior to joining EH&E, I was a tenured faculty member at the University of Georgia where I carried out research, mentored students, and taught courses. I

earned a doctorate in Environmental Health from the Harvard School of Public Health and M.S. and B.S. degrees from Indiana University. I am active in professional service through organizations such as the International Society for Exposure Science, Chulabhorn Research Institute, and the World Health Organization.

Throughout my professional career, I have assessed exposures to chemical contaminants, such as perfluorooctanoic acid (PFOA), in the context of health risk analyses in community settings. Beginning with my doctoral research in graduate school more than 20 years ago, I developed population-based models of exposure to chemicals through food, beverages, and air. As a post-doctoral student, I managed what remains to date the largest longitudinal study of concurrent exposures to chemical contaminants in food, water, air, indoor dust, soil, skin, blood, and urine. Since that time, I have directed or participated in dozens of investigations of exposure to contaminants via ingestion, the principal route of exposure at issue in this matter. Additional examples of my relevant experience, including all of my publications within the last ten (10) years, are described in my resume, which is provided as Attachment 1 to this report. A description of my compensation for this project and a listing of my prior deposition and trial testimony within the last four (4) years are provided in Attachments 2 and 3 to this report.

3.0 SUMMARY OF OPINIONS

I offer the following opinions to a reasonable degree of scientific certainty:

1. Ms. Bartlett is a “Class Member” under the Leach Case settlement, because she consumed for more than one year prior to December 4, 2004, drinking water provided by the Tupper Plains-Chester Water Service District containing PFOA attributable to releases from DuPont’s Washington Works plant at a concentration greater than 0.05 parts per billion (“ppb”).
2. Based on her PFOA exposure history, Ms. Bartlett first met the criteria for Class Member status no later than December 1984.
3. Mr. Wolf is a “Class Member” under the Leach Case settlement, because he consumed for more than one year prior to December 4, 2004, drinking water provided by the Lubeck Public Service District containing PFOA attributable to releases from DuPont’s Washington Works plant at a concentration greater than 0.05 ppb.
4. Based on his PFOA exposure history, Mr. Wolf first met the criteria for Class Member status no later than December 2000.

4.0 RESEARCH QUESTION

I was asked to determine whether Carla Bartlett and John Wolf each had sufficient exposure to PFOA through their drinking water to qualify as “Class Members” under the following specific criteria established by the Court for purposes of settling the Leach Case:

Based on the foregoing, it is, therefore, hereby accordingly ORDERED, ADJUDGED, AND DECREED that:

A. the Class is certified as those individuals: (1) who for the period of at least one year up to and including December 3, 2004, consumed drinking water containing .05 ppb or greater of C-8 attributable to releases from Washington Works from (a) any of six specified Public Water Districts (each as particularly described in Schedule 2.1.1(A) of the Settlement), (b) any Eligible Private Source within the geographic boundaries of the Public Water Districts that is the individual's sole source of drinking water at that location or (c) any Eligible Private Source more particularly described in Schedule 2.1.1(B) attached to the Settlement that was the individual's sole source of drinking water at that location; and (2) who (a) did not exercise their right to Opt Out of the Certified Class or (b) have not elected to waive their rights as a Class Member through execution of a Notice of Clarification Regarding Class Member Status filed with the Court in the Lawsuit;¹

The approach I have taken to the work would have been the same had E. I. du Pont de Nemours and Company (DuPont) hired me to carry out the analyses. As I continue to review the information and any newly provided data, I reserve the right to supplement and refine my opinions. All the opinions I express herein I hold to a reasonable degree of scientific certainty.

5.0 BACKGROUND

5.1 PFOA

Ammonium perfluorooctanoate is a synthetic compound used in the production of chemicals that confer non-stick, water resistance, and related properties to carpet, clothing, paper packaging, and other products.² In water and other environmental media, ammonium perfluorooctanoate breaks down into ammonia and the anion form of the parent molecule, of which the latter is commonly referred to as PFOA and is also known as C8.³

¹ 2/28/05 Final Order Approving Settlement in Jack W. Leach v. E. I. du Pont de Nemours & Co., Civil Action No. 01-C-608 (pp. 11-12); Class Action Settlement Agreement (Leach Case) at Section 2.1.1 and Schedule 2.1.1(A). I have been informed that neither Ms. Bartlett nor Mr. Wolf filed to opt out of Class Membership or asked to be excluded by filing a Notice of Clarification with the Leach Court.

² Draft Toxicological Profile for Perfluoroalkyls, Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Atlanta, Georgia, May 2009, p. 2.

³ Paustenbach DJ, Panko JM, Scott PK, Unice KM. 2007. A methodology for estimating human exposure to perfluorooctanoic acid (PFOA): a retrospective exposure assessment of a community (1951-2003). Journal of Toxicology and Environmental Health, Part A, 70:28-57.

PFOA has a half-life in humans of approximately 2.3 – 3.4 years and will accumulate in the body when the rate of intake is greater than the rate of elimination.⁴ Living within public water districts contaminated with PFOA has been associated with elevated accumulation of PFOA in people.⁵

5.2 DuPont Washington Works

The DuPont Washington Works facility is reported to have used PFOA in the manufacturing of fluoropolymers since 1951.⁶ PFOA releases from the Washington Works to air and water, deposition to ground surfaces, entry into the Ohio River, infiltration into well fields, and distribution through public and private drinking water supplies is described in detail in the scientific literature.⁷

5.3 C8 Health Project

In February 2005, the Circuit Court of Wood County, West Virginia approved a class action settlement in the Leach Case relating to releases of PFOA (*i.e.*, C8) from the DuPont Washington Works manufacturing facility in Parkersburg, West Virginia.⁸ The settlement resulted in the C8 Health Project, a population-wide health study of the impacted community, defined under the settlement and in the study as “Class Members,” and formation of a three-member C8 Science Panel (the “Panel”) to evaluate whether a probable link exists between PFOA and human disease, specifically “among Class Members.”^{9,10}

Paraphrasing from Frisbee et al.,¹¹ the Panel surveyed 69,030 people in 2005-2006 for eligibility as Class Members based on the criteria referenced above that had been established by the Court. Key eligibility criteria included: (1) consuming contaminated drinking water from any of six public water districts in Ohio or West Virginia or from private water sources within the geographical boundaries of the public water sources, which contained PFOA concentrations of at least 0.05 ppb, and (2) at least 12 months of exposure to such contaminated water between 1950

⁴ Winquist A, Lally C, Shin HM, Steenland K. 2013. Design, methods, and population for a study of PFOA health effects among highly exposed mid-Ohio valley community residents and workers. *Environmental Health Perspectives*, 121:893-899., and citations.

⁵ Steenland K, Jin C, MacNeil J, Lally C, Ducatman A, Vieira V, Fletcher T. 2009. Predictors of PFOA levels in a community surrounding a chemical plant. *Environmental Health Perspectives*, 117:1083-1088.

⁶ Paustenbach et al. 2007, cited previously.

⁷ For example: Shin HM, Vieira VM, Ryan PB, Detwiler R, Sanders B, Steenland K, Bartell SM. 2011. Environmental fate and transport modeling for perfluorooctanoic acid emitted from the Washington Works facility in West Virginia. *Environmental Science and Technology*, 45:1435-1442.

⁸ Frisbee SJ, Brooks AP, Maher A, Flensburg P, Arnold S, Fletcher T, Steenland K, Shankar A, Knox SS, Pollard C, Halverson JA, Vieira VM, Jin C, Leyden KM, Ducatman AM. 2009. The C8 Health Project: design, methods, and participants. *Environmental Health Perspectives*, 117:1873-1882.

⁹ Frisbee et al. 2009, cited previously.

¹⁰ http://www.c8sciencepanel.org/panel_background.html. [accessed 11 November 2014].

¹¹ Frisbee et al. 2009, cited previously.

and December 3, 2004, at a primary residence, place of work, or school. Participants provided documentation of their eligibility,¹² and the C8 Health Project team verified the authenticity of the documentation, placing scanned copies in the participant's electronic data record for the study.

Based on the findings of the C8 Health Project and relevant information from the scientific literature, the Panel concluded that there was a probable link between PFOA exposure and six categories of disease among Class Members: diagnosed high cholesterol; ulcerative colitis; thyroid disease; testicular cancer; kidney cancer; and pregnancy-induced hypertension/preeclampsia.¹³ The Panel's primary findings are contained in its *Probable Link* reports.¹⁴

6.0 ANALYSIS

I conducted my own analyses of Ms. Bartlett's and Mr. Wolf's PFOA exposure histories to determine whether and when they met the criteria to qualify as Class Members.

6.1 Approach

In my analyses, I adopted the Class Member eligibility criteria noted above that were established by the Court and incorporated information from the C8 Health Project for Ms. Bartlett and Mr. Wolf. The materials that I relied upon to inform my opinion include but are not limited to: (i) records from the C8 Health Project; (ii) plaintiff fact sheets for Ms. Bartlett and Mr. Wolf; (iii) depositions of Ms. Bartlett and Mr. Wolf; (iv) property records; (v) water service records; and (vi) historical PFOA levels in drinking water attributable to the Washington Works plant calculated by the Panel. I also verified the exposures of Ms. Bartlett and Mr. Wolf to drinking water from one of the six water districts contaminated with greater than 0.05 ppb of PFOA. Following the general approach of the Panel, I performed sensitivity analyses to evaluate the reliability of the information that I considered.

With regard to PFOA levels in public drinking water, I relied upon the annual average concentrations of PFOA for the Tupper Plains-Chester Water District and Lubeck Public Water District attributable to the Washington Works plant reported by the Panel in Figure 2 of Shin et

¹² C8 Health Project Mail Survey, Brookmar, Inc.; Instructions.pdf, p. 3. Acceptable documentation for exposure via drinking water included utility bills; bank statements; major credit card statement; deed to property; lease or rental agreement; previous W-2 or W-4; employment record or pay stub; vehicle title, registration or insurance card; homeowner's or renter's insurance card; cancelled check showing name and address; voter registration card; real or personal property tax receipts; and school records.

¹³ <http://www.c8sciencepanel.org/index.html> [accessed 11 November 2014].

¹⁴ http://www.c8sciencepanel.org/prob_link.html [accessed 11 November 2014].

al. 2011.¹⁵ To extract values from that figure, I followed a method previously described in the peer-reviewed scientific literature.^{16,17} In brief, I digitized the information in Figure 2 and then extracted values for annual average PFOA in drinking water for each year from 1955 – 2007.¹⁸ The Panel used a similar approach to estimate PFOA emissions to air from a figure provided by DuPont.¹⁹ The PFOA concentrations that I extracted are presented in Attachment 4 of this report. Sensitivity analyses that I conducted indicate that PFOA concentrations determined from Figure 2 by this method are precise to within 1.8% on average, and average extracted concentrations greater than 0.05 ppb are highly unlikely to be less than 0.05 ppb on the actual figure.^{20,21}

6.2 Carla Bartlett

To examine Ms. Bartlett's exposure to PFOA, I reviewed the information on her residential, work, and medical histories, including information contained in records from her participation in the C8 Health Project, her plaintiff fact sheets, and depositions.

Ms. Bartlett testified in her deposition that she resided on Lottridge Road, Coolville, Ohio, from 1960 – 1989, living on property owned by her parents, Mildred B. Clem and Carl L. Clem.^{22,23} Property records that I obtained from Athens County, Ohio, and Ms. Bartlett's plaintiff fact sheet indicate that Mr. and Mrs. Clem owned the F010010040000 parcel which includes both 2540 and 2546 Lottridge Road, Coolville, Ohio until 1998.^{24,25,26} According to records from the Tupper

¹⁵ Shin HM, Vieira VM, Ryan PB, Detwiler R, Sanders B, Steenland K, Bartell SM. 2011. Environmental fate and transport modeling for perfluorooctanoic acid emitted from the Washington Works facility in West Virginia. *Environmental Science and Technology*, 45:1435-1442.

¹⁶ Shin HM, Ryan PB, Vieira VM, Bartell SM. 2012, Modeling the air-soil transport pathway of perfluorooctanoic acid in the mid-Ohio Valley using linked air dispersion and vadose zone model. *Atmospheric Environment*. 51:67-74.

¹⁷ Google Scholar Search = engage digitizer.pdf. [accessed 25 November 2014].

¹⁸ Engage digitizer 5.1 (<http://digitizer.sourceforge.net>).

¹⁹ Shin et al., 2012, cited previously

²⁰ Twelve professional environmental scientists, data scientists, or engineers were trained on use of the software and were requested to extract annual average concentrations of PFOA for the Tupper Plains-Chester Water District, as illustrated in Figure 2 of Shin et al. 2011. In a general linear model of extracted PFOA concentration in relation to year, the root mean square error was 0.003 ppb, which is 1.8% of the overall mean PFOA concentration extracted from the figure.

²¹ To further evaluate the reliability of the PFOA concentrations extracted from the figure, I evaluated the likelihood that the lowest extracted concentration (0.12 ppb in 2005) was actually less than 0.05 ppb, the limit for Class eligibility. Using the data and general linear model described in the preceding footnote, the likelihood that the average extracted concentration of 0.12 ppb is actually reported in the figure as less than 0.05 ppb is lower than 0.0001%.

²² Deposition of Carla Bartlett; June 18, 2014 (50866condensed.pdf), p. 44.

²³ In a personal communication, Ms. Bartlett recalled that she lived with her parents Mildred B. Clem and Carl L. Clem during that period, except for the final three years during which time she lived in a trailer on the family property on Lottridge Road.

²⁴ Second Amended and Supplemental PFS of Carla M Bartlett.pdf, p. 3 and p.13.

²⁵ Athens County, Ohio – Property Record Parcel F010010040000 zoomed in.pdf. Available: <http://www.athenscountyauditor.org/Map.aspx?Load=String&Todo=Find&SearchString=F010010040000> [accessed 5 December 2014]

Plains-Chester Public Water District of Ohio, the public water district began to deliver water to 2540 Lottridge Road in September of 1983.²⁷ Ms. Bartlett recalls that when the 2540 Lottridge Road water tap was connected, all building structures on the family's property received water from Tupperts Plains.^{28,29,30} The Tupperts Plains-Chester Public Water District is one of the six public water supplies identified on Schedule 2.1.1(A) of the Leach Case settlement and included within the Class Member definition set by the Court.³¹ Information from the Panel indicates that PFOA concentrations in the Tupperts Plains-Chester Public Water District attributable to the Washington Works plant ranged from 0.17 – 0.24 ppb on an annual basis from 1983 – 1989, the period when public water was received at Ms. Bartlett's Lottridge Road residences and prior to her diagnosis with kidney cancer in 1997.^{32,33,34}

Ms. Bartlett reported in her plaintiff fact sheet and C8 Health Project records and also testified in her deposition that she resided at 3933 Roadside Park Road, Guysville, Ohio, from 1993 to present.^{35,36,37} The address for this property was formerly 21363 U.S. Route 50 East, Guysville, Ohio, and had changed to the 3933 Roadside Park Road address after U.S. Route 50 was expanded.³⁸ The property records from Athens County, Ohio, for this parcel from the year 2000 indicate the 21363 US Route 50 East address, and the records from 2014 indicate the 3933 Roadside Park Road address.^{39,40} For the first six years at that location, Ms. Bartlett stated that she and her husband rented a residential building on that property from John and Cleo Depoy.⁴¹ Ms. Bartlett stated that the Depoys provided water to her rental property and that the Depoys, in turn, received water from the Tupperts Plains-Chester Water District.⁴² Ms. Bartlett's recollection about the source of the Depoys' water is consistent with records from the Tupperts Plains-Chester Public Water District that indicate the public water district began to deliver water to the Depoy

²⁶ In her deposition, Ms. Bartlett identified her parent's address as 2523 Lottridge Road.

²⁷ Second Amended and Supplemental PFS of Carla M. Bartlett.pdf, p. 15

²⁸ Personal communication with Carla Bartlett, December 8, 2014.

²⁹ In a personal communication, Ms. Bartlett stated that the trailer she lived in on the family Lottridge Road property received water from the home of her brother-in-law and sister (Donald and Hazel Barnhouse), which was supplied by the Tupperts Plains-Chester Public Water District. The date by which the Barnhouses' residence first received Tupperts Plains-Chester Public Water District has not yet been determined.

³⁰ Athens County, Ohio – Property Record Parcel F010010040001.pdf

³¹ 2/28/05 Final Order Approving Settlement in Jack W. Leach v. E. I. du Pont de Nemours & Co., Civil Action No. 01-C-608 (pp. 11-12); Class Action Settlement Agreement (Leach Case) at Section 2.1.1 and Schedule 2.1.1(A).

³² Shin et al., 2011, cited previously, Figure 2.

³³ Carla Bartlett C8 Health Panel Records.pdf, p. 3.

³⁴ Second Amended and Supplemental PFS of Carla M. Bartlett.pdf, p. 6.

³⁵ Second Amended and Supplemental PFS of Carla M. Bartlett.pdf, p. 2.

³⁶ Carla Bartlett C8 Health Panel Records.pdf, p. 8.

³⁷ Deposition of Carla Bartlett; June 18, 2014 (50866condensed.pdf), p. 31.

³⁸ *Id.*

³⁹ Athens County, Ohio – Property Record Parcel F010010024906_2000.pdf.

⁴⁰ Athens County, Ohio – Property Record Parcel F010010024906.pdf. Available: <http://www.athenscountyauditor.org/Data.aspx?ParcelID=F010010024906> [accessed 24 November 2014].

⁴¹ Personal communication with Carla Bartlett, November 10, 2014.

⁴² *Id.*

property in 1967.⁴³ The water records show the older address for the Depoys property as 21357 U.S. Route 50, Guysville, Ohio, which is currently known as 3955 Roadside Park Road, Guysville, Ohio.^{44,45,46} Ms. Bartlett stated that she and her husband purchased a portion of the Depoy property in 1999.⁴⁷ Real estate property records from Athens County, Ohio, corroborate her recollection.⁴⁸ Records that I reviewed indicate that the Tupper Plains-Chester Water District began to deliver water directly to Ms. Bartlett's residence beginning in July 1999.⁴⁹ Information from the Panel indicates that PFOA concentrations in the Tupper Plains-Chester Public Water District ranged from 0.29 – 0.47 ppb on an annual basis from 1993 – 1997, prior to her kidney cancer diagnosis in 1997 and during the time Ms. Bartlett received public water at her U.S. Route 50 East/Roadside Park Road residence. Then from 1997 – 2005, the PFOA concentrations in Tupper Plains-Chester Public Water District attributable to the Washington Works plant ranged from 0.12 – 0.85 ppb on an annual basis when Ms. Bartlett received public water at her U.S. Route 50 East/Roadside Park Road residence.⁵⁰

Based on Ms. Bartlett's deposition testimony, her Plaintiff Fact Sheet, and the other information referenced above, Ms. Bartlett consumed the drinking water provided by the Tupper Plains-Chester Public Service District at each of the addresses mentioned above for at least one year.

6.3 John Wolf

To examine Mr. Wolf's exposure to PFOA, I reviewed the information on his residential, work, and medical histories, including information contained in records from the C8 Health Project, plaintiff fact sheets, and his deposition.

Mr. Wolf reported in his plaintiff fact sheet that he resided at several addresses along Wildwood Drive in Parkersburg, West Virginia from 1999 through the present that were served by the Lubeck Public Service District of West Virginia, one of the six contaminated water districts that are identified in Schedule 2.1.1(A) of the Leach Case settlement and are included in the Class Member definition set by the Court.⁵¹ Deposition testimony from a representative of the Lubeck

⁴³ TPC Water District Records-Depoy-21357US50.pdf.

⁴⁴ *Id.*

⁴⁵ Athens County, Ohio – Property Record Parcel F010010024900_1996.pdf.

⁴⁶ Athens County, Ohio – Property Record Parcel F010010024900.pdf. Available: <http://www.athenscountyauditor.org/Data.aspx?ParcelID=F010010024900> [accessed 24 November 2014].

⁴⁷ Personal communication with Carla Bartlett, November 10, 2014.

⁴⁸ Athens County, Ohio – Property Record Parcel F010010024906.pdf. Available: <http://www.athenscountyauditor.org/Data.aspx?ParcelID=F010010024906> [accessed 24 November 2014].

⁴⁹ Tab_33_-_Bartlett,_Carla_Marie_-_Tupper_Plains-Chester_Water_District_-_Records_-_13_-_Bates_-_a08700000dPy5fAAC_-_20140516090456.pdf.

⁵⁰ Shin et al., 2011, cited previously, Figure 2.

⁵¹ 2/28/05 Final Order Approving Settlement in Jack W. Leach v. E. I. du Pont de Nemours & Co., Civil Action No. 01-C-608 (pp. 11-12); Class Action Settlement Agreement (Leach Case) at Section 2.1.1 and Schedule 2.1.1(A).

Public Service District indicates that the Wildwood Drive area of Parkersburg was within the public water district service region by at least 1961.^{52,53,54}

For the years 1999 – 2000, Mr. Wolf stated that he lived at 66 Wildwood Drive, Parkersburg, West Virginia and also at 19 E Wildwood Drive, Parkersburg, West Virginia.^{55,56} Records that I obtained from Wood County, West Virginia, indicate that both of those addresses correspond to a single parcel of property which was owned by Mr. Wolf's mother, Priscilla M Wolf.^{57,58} Records that I reviewed indicate that the Lubeck Public Service District began to deliver water to Mr. Wolf's mother's property in January 1998.⁵⁹ Information from the Panel indicates that PFOA concentrations in the Lubeck Public Service District water attributable to the Washington Works plant ranged from 1.52 – 1.98 ppb on an annual basis from 1999 – 2000, the period when public water was received at Mr. Wolf's 19 E Wildwood Drive residence and prior to his diagnosis with ulcerative colitis in 2012.^{60,61}

For the years 2000 – March 2002, Mr. Wolf stated that he lived at 6 Wildwood Drive, Apartment A, Parkersburg, West Virginia, which he rented from Stan Bucklew.^{62,63,64,65} Wood County, West Virginia, property records show the same parcel is also referred to as 60 Wildwood Drive.⁶⁶ Mr. Wolf stated that expenses for water were included in his rent.⁶⁷ Lubeck Public Service records indicate that public water was received at 60 Wildwood Drive under Mr. Bucklew's account beginning in December 1998.⁶⁸ Information from the Panel indicates that PFOA concentrations in the Lubeck Public Service District water attributable to the Washington Works plant ranged from 0.69 – 1.52 ppb on an annual basis from 2000 – 2002, periods when Mr. Wolf received public water at his 6 Wildwood Drive residence and prior to his diagnosis with ulcerative colitis in 2012.^{69,70}

⁵² Deposition of James Cox – Lubeck PSD (Transcript Vol I.pdf), p. 53.

⁵³ Deposition of James Cox – Lubeck PSD (Transcript Vol II.pdf), p. 242.

⁵⁴ Exhibit 14A from Deposition of James Cox – Lubeck PSD (Exhibit 14A.pdf)

⁵⁵ Wolf Plaintiff Fact Sheet.pdf, p. 3.

⁵⁶ John Wolf C8 Health Panel Records.pdf, p. 7.

⁵⁷ Wood County, WV - Property Info - 03 216002500000000.pdf. Available: <http://gis.kimballdata.com/WoodCounty/code/map.aspx> [accessed 24 November 2014].

⁵⁸ Wood County, WV - Property Tax - 216-00250000.pdf. Available: <http://129.71.205.120/webtax/> [accessed 24 November 2014].

⁵⁹ Lubeck Public Service District - Wolf.pdf, p. 2-3.

⁶⁰ Shin et al., 2011, cited previously, Figure 2.

⁶¹ Wolf Plaintiff Fact Sheet.pdf, p. 6-7.

⁶² John Wolf C8 Health Panel Records.pdf, p. 7

⁶³ Wolf Plaintiff Fact Sheet.pdf, p. 3.

⁶⁴ Personal communication with John Wolf, November 25, 2014.

⁶⁵ Wood County, WV - Personal Tax - 6 Wildwood Drive.pdf. Available: <http://129.71.205.120/webtax/> [accessed 24 November 2014].

⁶⁶ Wood County, WV - Property Info - 03 213000500000000.pdf. Available: <http://gis.kimballdata.com/WoodCounty/code/map.aspx> [accessed 24 November 2014]

⁶⁷ Personal communication with John Wolf, November 25, 2014.

⁶⁸ Lubeck Public Service District - 60 Wildwood Dr.pdf

⁶⁹ Shin et al., 2011, cited previously, Figure 2.

For the years March 2002 through the present, Mr. Wolf stated that he has lived at 263 Wildwood Drive, Parkersburg, West Virginia.^{71,72} His records from the C8 Health Project contain a personal property tax receipt for tax year 2003 and real estate property records from Wood County, West Virginia, list his address as 263 Wildwood Drive, Parkersburg, West Virginia.^{73,74} With regard to the source of water at this location, the records that I reviewed indicate that Lubeck Public Service District began to deliver water under his account for this property in November 2001.⁷⁵ Information from the Panel indicates that PFOA concentrations in the Lubeck Public Service District water attributable to the Washington Works plant ranged from 0.25 – 0.56 ppb on an annual basis from 2002 – 2005, periods when Mr. Wolf received public water at his 263 Wildwood Drive residence and prior to his diagnosis with ulcerative colitis in 2012.^{76,77}

Based on his deposition testimony, Plaintiff Fact Sheet and other information noted above, Mr. Wolf consumed the drinking water provided by the Lubeck Public Service District at each of the locations referenced above for at least one year.

7.0 SUMMARY

Using information gathered as part of the C8 Health Project, information relied upon and generated by the C8 Science Panel, and information produced through this litigation, in conjunction with records obtained as part of my analyses, I was able to confirm that both Ms. Bartlett and Mr. Wolf consumed drinking water from one of the six public water districts at issue in this litigation containing PFOA attributable to DuPont's Washington Works plant at a concentration greater than 0.05 ppb for more than one year between 1950 and December 3, 2004. Based on their PFOA exposure histories, Ms. Bartlett first met the criteria for Class Member status no later than December 1984 and Mr. Wolf first met the criteria for Class Member status no later than December 2000. In forming these opinions, I used the Class Member eligibility criteria established by the Court and incorporated the information cited herein, including from the C8 Health Project, for Ms. Bartlett and Mr. Wolf. I also verified their exposure to drinking water from one of the six water districts contaminated with greater than 0.05 ppb of PFOA. Further following methods of the C8 Science Panel, I performed sensitivity analyses to evaluate the reliability of the information on PFOA levels in drinking water that I considered.

⁷⁰ Wolf Plaintiff Fact Sheet.pdf, p. 6-7.

⁷¹ John Wolf C8 Health Panel Records.pdf, p. 7.

⁷² Deposition of John Wolf; June 12, 2014 (5082condensed.pdf), p. 39.

⁷³ John Wolf C8 Health Panel Records.pdf, p. 27.

⁷⁴ Wood County, WV - Property Info - 03 216001300000000.pdf. Available: <http://gis.kimballdata.com/WoodCounty/code/map.aspx> [accessed 24 November 2014].

⁷⁵ Lubeck Public Service District - Wolf.pdf, p. 4-5.

⁷⁶ Shin et al., 2011, cited previously, Figure 2.

⁷⁷ Wolf Plaintiff Fact Sheet.pdf, p. 6-7.

ATTACHMENT 1 – RESUME

DAVID L. MACINTOSH, Sc.D., C.I.H.

CHIEF SCIENCE OFFICER • DIRECTOR OF ADVANCED ANALYTICS

EDUCATION

Sc.D. Environmental Health, Harvard School of Public Health, 1995
M.S. Environmental Science, Indiana University, Bloomington, IN, 1991
B.S. Decision Science, Indiana University, Bloomington, IN, 1985

BACKGROUND

2012 – Chief Science Officer, Director of Advanced Analytics, Environmental Health & Engineering, Inc.
2005 – 2012 Principal Scientist and Associate Director of Advanced Analytics and Building Science, Environmental Health & Engineering, Inc.
2009 – Adjunct Associate Professor of Environmental Health, Harvard School of Public Health, Boston, MA
2007 – 2011 Instructor of Environmental Management, Harvard Extension School, Cambridge, MA
2002 – 2005 Principal Scientist, Environmental Health & Engineering, Inc., Needham, MA
2001 – 2002 Associate Professor (Tenured), Department of Environmental Health Science, University of Georgia, Athens, GA
1996 – 2001 Assistant Professor, Department of Environmental Health Science, University of Georgia

EXPERIENCE

David L. MacIntosh is Chief Science Officer (CSO) and Director of Advanced Analytics at Environmental Health & Engineering, Inc. in Needham, Massachusetts. He has successfully led hundreds of projects involving public health in relation to chemicals, infectious agents, ionizing radiation, and pharmaceuticals. Dr. MacIntosh specializes in directing teams of experts in environmental health, biostatistics, epidemiology, toxicology, engineering, and related fields. His Advanced Analytics practice analyzes complex datasets using sophisticated programming and statistical tools, develops systems to support data driven decisions, and provides data visualization services for EH&E's clients and staff. His recent activity has included risk management in communities and for hospitals, pharmacoepidemiology, energy conservation, and training of public health professionals. His experience also includes development and dissemination of education, training, outreach, and technology transfer materials on public health management for local, national, and international audiences.

In addition to his role at EH&E, Dr. MacIntosh is an Adjunct Associate Professor of Environmental Health at the Harvard School of Public Health where he teaches a course on human exposure assessment. Prior to joining EH&E, Dr. MacIntosh was a tenured faculty member at the University of Georgia. He earned a doctorate in Environmental Health from the Harvard School of Public Health and a M.S. and B.S. from Indiana University. Dr. MacIntosh is active in professional service through organizations such as the International Society for Exposure Science and the World Health Organization.



PROFESSIONAL REGISTRATION

American Board of Industrial Hygiene, Certified in Comprehensive Practice

PROFESSIONAL AFFILIATIONS

International Society of Exposure Science

Society for Risk Analysis

American Industrial Hygiene Association

International Society of Indoor Air Quality and Climate

SELECTED EXPERIENCE

- Directed the analysis of energy use information among metro Boston health care organizations for the Health Care Working Group of the Boston Green Ribbon Commission in support of the City of Boston Climate Action Plan.
- Quantified exposure-response relationships for efficacy and safety outcomes from a randomized clinical trial of a novel oral anti-coagulant indicated for patients diagnosed with non-valvular atrial fibrillation.
- Developed predictive models for characterizing the effectiveness of energy conservation measures that have yielded a 15% reduction in electricity and natural gas consumption in a network of acute care hospitals.
- Managed a team of data scientists, programmers, and health professionals that developed systems for automated assembly, statistical analysis, reporting, and visualization of safety and risk management information for hospitals, research institutions, and universities.
- Developed and delivered educational and training materials on health risk analysis and risk communication for the Asia-Pacific Economic Cooperation, focusing on public health and economic development professionals in developing economies in Southeast Asia and the Middle East.
- Developed on-line educational materials on risk management of chemical agents that have been used to train over 500 hundred environmental, health, and safety professionals from over 20 nations in Asia.
- For the U.S. Environmental Protection Agency, directed the synthesis and critical review of information on mitigation strategies for building-related polychlorinated biphenyls (PCBs) compiled from the peer reviewed literature, grey literature, and interviews with subject matter experts in North America and Europe.
- Directed an analysis of public health benefits for poor and minority child populations with asthma anticipated to result from a renewable energy portfolio standard in Michigan. Communicated findings to the general public through media interviews and policy makers via a briefing with state legislators.

- Led the health risk characterization component of a two-year, multi-phased investigation of “Chinese Drywall” conducted on behalf of the U.S. Consumer Product Safety Commission. Provided communications and outreach to the general public through interviews on international radio (BBC) and national television (MSNBC).
- Authored a guidance document published by the World Health Organization on public health management of chemical incidents for use by health and industry officials at national, provincial, and local levels throughout the world.
- Principal Investigator of an eight-year body of work that details the effectiveness of residential air cleaning systems, both in-duct and portable, for controlling exposures to asthma triggers and other public health relevant aerosols. Findings are disseminated to consumers, caregivers for asthma patients, HVAC professionals, and the medical community through earned media, building trade shows, technical conferences, and peer-reviewed scientific publications.
- Led the health risk characterization component of an in-depth measurement and modeling assessment of exposure to radon and ionizing radiation associated with granite finishes in U.S. homes.
- First draft author of the World Health Organization *Toolkit for Human Health Risk Assessment: Chemical Hazards*. The toolkit is a practical guide to conducting health risk assessments of chemical hazards intended to build capacity in developing economies and economies in transition.
- For a public school system, led a multidisciplinary team in developing a detailed assessment of exposure to PCBs used in building material that involved comprehensive building characterization, evaluation of alternative mitigation systems, implementation of a cost-effective mitigation system, training of facilities personnel, and risk communications to public officials, facilities staff, teachers, and the school community.
- Designed and executed a national survey of indoor air quality programs in schools of the U.S. for the EPA. Senior author of the resulting peer-reviewed publication; a benchmark on the prevalence of IAQ programs in U.S. public and private schools, and barriers to change.
- Conducted soil gas vapor intrusion assessments for single family homes, schools, and commercial buildings throughout the United States. These investigations involved state-of-the-art measurement, modeling, and data analysis techniques, following practices recommended by the EPA.
- Edited and co-authored the first monograph on human exposure assessment for environmental hazards, *Environmental Health Criteria 214: Exposure Assessment*, published by the World Health Organization. The document is a comprehensive and detailed description of best practices for design, implementation, and interpretation of

exposure assessments. The manual serves a textbook for graduate level courses in exposure and risk assessment at selected universities.

- Directed the largest longitudinal investigation to date of aggregate human exposure to chemical pollutants, the National Human Exposure Assessment Survey (NHEXAS) in Maryland, sponsored by the U.S. Environmental Protection Agency. Led the field teams and was primary author of more than 10 technical papers from this study published in scientific journals.
- Authored the first peer-reviewed papers on two-dimensional Monte Carlo simulation for incorporating inter-individual variability and scientific uncertainty into environmental exposure assessments.

PEER-REVIEWED PUBLICATIONS

Brown KW, Minegishi T, Allen JG, McCarthy JF, Spengler JD, and **MacIntosh DL**. 2014. Reducing patients' exposures to asthma and allergy triggers in their homes: an evaluation of effectiveness of grades of forced air ventilation filters. *Journal of Asthma*, 12 March 2014.

Allen JG, Zwack LM, **MacIntosh DL**, Minegishi T, Stewart JH and McCarthy JF. 2013. Predicted indoor radon concentrations from a Monte Carlo simulation of 1,000,000 granite countertop purchases. *Journal of Radiological Protection*, 33(1):151-162.

Suh HH, Myatt TA, Vincent MS, **MacIntosh DL**. 2012. Markers of Inflammation in Alveolar Cells Exposed to Fine Particulate Matter from Prescribed Fires and Urban Air. *Journal of Occupational and Environmental Medicine*, 53(10):1110-1114.

Allen J, Myatt T, **MacIntosh DL**, Ludwig J, Minegishi T, Stewart J, Connors B, Grant M, McCarthy J. 2012. Assessing Risk of Nosocomial Legionnaires' Disease from Environmental Sampling – The Limits of Using a Strict Percent Positivity Approach. *American Journal of Infection Control*, 40(10):917-921.

Allen J, **MacIntosh DL**, Saltzman L, Baker B, Matheson J, Recht J, Minegishi T, Fragala M, Myatt T, Spengler J, Stewart J, McCarthy J. 2012. Elevated corrosion rates and hydrogen sulfide in homes with 'Chinese Drywall'. *Science of the Total Environment*, 426:113-119.

MacIntosh D, Minegishi T, Fragala M, Allen J, Coghlan K, Stewart J, McCarthy J. 2012. Mitigation of Building-Related Polychlorinated Biphenyls in Indoor Air of a School. *Environmental Health*, 11:24.

Stewart JH, **MacIntosh DL**, Allen JG, McCarthy JM. 2012. Germanium, Tin and Copper in *Patty's Toxicology, Sixth Edition*, edited by Eula Bingham and Barbara Cohrssen. New York, NY: John Wiley and Sons, Inc.

MacIntosh DL (Expert Committee Member). 2011. *Evaluating and Mitigating the Risk of Disease Transmission at Airport and on Aircraft*. Washington, DC, USA: National Academy of Sciences.

Allen J, Minegishi T, McCarthy J, Fragala M, Coghlan K, Stewart J, **MacIntosh DL**. 2011. Performance Evaluation of Mitigation Methods for PCBs in Construction Materials. In: *Proceedings of Indoor Air 2011: The 12th International Conference on Indoor Air Quality and Climate*. Austin, TX, USA. June 5-10, 2011.

MacIntosh DL, Minegishi T, Allen J, Levin-Schwartz Y, McCarthy J, Stewart J, Coghlan K. 2011. Risk Assessment for PCBs in Indoor Air of Schools. In: *Proceedings of Indoor Air 2011: The 12th International Conference on Indoor Air Quality and Climate*. Austin, TX, USA. June 5-10, 2011.

Minegishi T, Allen J, Coghlan K, **MacIntosh DL**. 2011. PCB Emission Rates and Flux from Legacy Construction Materials. In: *Proceedings of Indoor Air 2011: The 12th International Conference on Indoor Air Quality and Climate*. Austin, TX, USA. June 5-10, 2011.

Myatt TA, Minegishi T, Allen J, **MacIntosh DL**. 2011. Control of PM_{2.5} Infiltration in High Rise Residential Buildings: A Modeling Analysis. In: *Proceedings of Indoor Air 2011: The 12th International Conference on Indoor Air Quality and Climate*. Austin, TX, USA. June 5-10, 2011.

Myatt TA, Kaufman MH, Allen JA, **MacIntosh DL**, Fabian MP, McDevitt JJ. 2010. Modeling the Airborne Survival of Influenza Virus in a Residential Setting - The Impacts of Home Humidification. *Environmental Health*, 9: 55.

Myatt T, Allen J, Minegishi T, McCarthy W, **MacIntosh D**, McCarthy J. 2010. Assessing exposure to granite countertops – Part 1: Radiation. *Journal of Exposure Science and Environmental Epidemiology*, 20:273-280.

Allen J, Minegishi T, Myatt T, McCarthy J, **MacIntosh D**. 2010. Assessing exposure to granite countertops – Part 2: Radon. *Journal of Exposure Science and Environmental Epidemiology*, 20:263-272.

MacIntosh D, Minegishi T, Kaufman M, Baker B, Allen J, Levy J, Myatt T. 2010. The benefits of whole-house in-duct air cleaning in reducing exposures to fine particulate matter of outdoor origin: A modeling analysis. *Journal of Exposure Science and Environmental Epidemiology*, 20:213-224.

MacIntosh D, Stewart J, Myatt T, Sabato J, Flowers G, Brown K, Hlinka D, Sullivan D. 2010. Use of CALPUFF for exposure assessment in a near field, complex terrain setting. *Atmospheric Environment*, 44(2):262-270.

MacIntosh DL, Myatt TA, Ludwig JF, Baker BJ, Suh HH, Spengler JD. 2008. Whole house particle removal and clean air delivery rates for in-duct and portable ventilation systems. *Journal of the Air and Waste Management Association*, 58(11):1474-1482.

Myatt, TA, Minegishi T, Allen JG, **MacIntosh DL**. 2008. Control of asthma triggers in indoor air: a modeling analysis. *Environmental Health*, 7:43.

McDevitt J, **MacIntosh DL**, Myatt TA. 2008. *Removal of influenza viral aerosols by high efficiency electrostatic air cleaner and implications for household infection transmission*. In: Proceedings of 11th International Conference on Indoor Air Quality and Climate. International Society of Indoor Air Quality and Climate. Copenhagen, Denmark.

MacIntosh DL, Brightman HS, Baker BJ, Myatt TA, Stewart JH, McCarthy JF. 2006. Airborne fungal spores in a cross-sectional study of office buildings. *Journal of Occupational and Environmental Hygiene*, 3(7):379-389.

Moglia D, Smith A, **MacIntosh DL**, Somers JL. 2006. Prevalence and implementation of IAQ programs in U.S. schools. *Environmental Health Perspectives*, 114(1):141-146.

Bird M, **MacIntosh DL**, Williams PL. 2004. Occupational exposure during routine activities in coal-fueled power plants. *Journal of Occupational and Environmental Hygiene*, 1(6):403-413.

Pang Y, **MacIntosh DL**, Camann DE, Ryan PB. 2002. Analysis of aggregate exposure to chlorpyrifos in the NHEXAS-Maryland investigation. *Environmental Health Perspectives*, 110(3):235-240.

Yanosky JD, Williams PL, **MacIntosh DL**. 2002. A comparison of two direct-reading aerosol monitors with the federal reference method for PM_{2.5} in indoor air. *Atmospheric Environment*, 36:107-113.

Echols SE, **MacIntosh DL**, Ryan PB. 2001. Temporal patterns of activities potentially related to pesticide exposure. *Journal of Exposure Analysis and Environmental Epidemiology*, 11(5):389-397.

MacIntosh DL, Kabiru C, Ryan PB. 2001. Longitudinal investigation of dietary exposure to selected pesticides. *Environmental Health Perspectives*, 109(2):145-150.

Ryan PB, Scanlon KA, **MacIntosh DL**. 2001. Analysis of dietary intake of selected metals in NHEXAS-Maryland investigation. *Environmental Health Perspectives*, 109(2):121-128.

Collins MJ, Williams PL, **MacIntosh DL**. 2001. Ambient air quality at the site of a former manufactured gas plant. *International Journal of Environmental Monitoring and Assessment*, 68(2):137-152.

Yanosky JD and **MacIntosh DL**. 2001. A comparison of four gravimetric fine particle sampling methods. *Journal of the Air and Waste Management Association*, 51:878-884.

Middendorf, PJ, **MacIntosh DL**, Tow LV, Williams PL. 2001. Performance of electronic flow rate meters used for calibration of air sampling pumps. *Journal of the American Industrial Hygiene Association*, 62(4):472-476.

Pang Y, **MacIntosh DL**, Ryan PB. 2001. Longitudinal investigation of aggregate oral intake of copper. *Journal of Nutrition*, 131:2171-2176.

MacIntosh DL, Kabiru C, Echols SL, Ryan PB. 2001. Dietary exposure to chloryrifos and associations with 3,5,6-trichloro-2-pyridinol in urine. *Journal of Exposure Analysis and Environmental Epidemiology*, 11(4):279-285.

Walker KD, Evans JS, **MacIntosh DL**. 2001. Use of expert judgment in exposure assessment Part I: Characterization of personal exposure to benzene. *Journal of Exposure Analysis and Environmental Epidemiology*, 11(4):308-322.

Tolbert P, Mulholland J, **MacIntosh DL**, Xu F, Daniels D, Devine O, Carlin B, Butler A, Nordenberg D, White M. 2000. Air quality and pediatric emergency room visits for asthma in Atlanta. *American Journal of Epidemiology*, 151:798-810.

MacIntosh DL, Kabiru C, Scanlon K, Ryan PB. 2000. Longitudinal investigation of exposure to arsenic, cadmium, chromium, and lead via beverage consumption. *Journal of Exposure Analysis and Environmental Epidemiology*, 10(2):196-205.

Ryan PB, Huet N, **MacIntosh DL**. 2000. Longitudinal investigation of exposure to arsenic, cadmium, and lead via drinking water. *Environmental Health Perspectives*, 108(8):731-735.

MacIntosh DL, Zimmer-Dauphinee SA, Manning RO, Williams PL. 2000. Aldehyde concentrations in ambient air of coastal Georgia, USA. *International Journal of Environmental Monitoring and Assessment*, 63:409-429.

Owens J, Dickerson S, **MacIntosh DL**. 2000. Demographic covariates of residential recycling efficiency. *Environment and Behavior*, 32(5):637-650.

Van Vreede K, **MacIntosh DL**, Black M. 1999. Estimating time-to-gravid for freshwater mussels following temperature conditioning in the laboratory. *Environmental Toxicology and Chemistry*, 18(7):1469-1473.

MacIntosh DL, Hammerstrom K, Ryan PB. 1999. Longitudinal exposure to selected pesticides in drinking water. *Human and Ecological Risk Assessment*, 5(3):575-588.

Whitaker LS, **MacIntosh DL**, Williams PL. 1999. Employee exposure to diesel exhaust in the electric utility industry. *American Industrial Hygiene Association Journal*, 60(5):635-640.

MacIntosh DL, Needham LL, Hammerstrom KA, Ryan PB. 1999. A longitudinal investigation of selected pesticide metabolites in urine. *Journal of Exposure Analysis and Environmental Epidemiology*, 9(5):494-501.

Scanlon KA, **MacIntosh DL**, Hammerstrom KA, Ryan PB. 1999. A longitudinal investigation of solid-food based dietary exposure to selected elements. *Journal of Exposure Analysis and Environmental Epidemiology*, 9(5):485-493.

Echols SL, **MacIntosh DL**, Hammerstrom KA, Ryan PB. 1999. Long-term average microenvironmental time budgets in Maryland. *Journal of Exposure Analysis and Environmental Epidemiology*, 9(5):502-512.

MacIntosh DL, Williams PL, Hunter DJ, Sampson LA, Morris SC, Willett WC, Rimm EB. 1997. Evaluation of a food frequency questionnaire-food consumption approach for estimating dietary intake of inorganic arsenic and methylmercury. *Cancer Epidemiology, Biomarkers, and Prevention*, 6:1043-1050.

Ryan PB, **MacIntosh DL**, Hammerstrom KH. 1998. The NHEXAS-MD Investigation: Temporal variability in exposures - Results and lessons learned. *Epidemiology*, 9(4) Supplement:S41.

MacIntosh DL, Spengler JD, Ozkaynak H, Ryan PB. 1996. Dietary exposures to selected metals and pesticides. *Environmental Health Perspectives*, 104(2):202-209.

MacIntosh DL, Xue J, Ozkaynak H, Spengler JD, Ryan PB. 1995. A population based exposure model for benzene. *Journal of Exposure Analysis and Environmental Epidemiology*, 5(3):375-403.

MacIntosh DL, Hull DA, Brightman HS, Yanagisawa Y, Ryan PB. 1994. A method for determining in use efficiency of Stage II vapor recovery systems. *Environment International*, 20(2):204-208.

MacIntosh DL, Suter II GW, Hoffman OF. 1994. Uses of probabilistic exposure models in ecological risk assessments of contaminated sites. *Risk Analysis*, 14(4):405-420.

ATTACHMENT 2

Statement of Compensation

Environmental Health & Engineering, Inc., Needham, MA, charges Levin, Papantonio, Thomas, Mitchell, Rafferty & Proctor, PA for my time at the rate of \$400 per hour.

ATTACHMENT 3

Trial or Deposition Testimony, Previous Four Years

BP 1330 Connecticut Avenue LLC et al. vs. Burger 1300 Conn. Ave., LLC, Superior Court for the District of Columbia. Trial Testimony. Retained by Counsel for the Defendant. September, 2010

Atwood et al., vs. Weyerhaeuser et al., Circuit Court of Wilcox County, Alabama. Deposition Testimony. Retained by Counsel for the Plaintiff

Bearden & Rehberger., vs. Honeywell International, U.S. District Court for the Middle District of Tennessee. Deposition Testimony. Retained by Counsel for the Defendant. September, 2013

Town of Lexington vs. Pharmacia vs. Pharmacia, Massachusetts District Court. Deposition Testimony. Retained by Counsel for the Plaintiff. October, 2014

ATTACHMENT 4

Table 1 Annual Average PFOA Concentration in Tupper Plains-Chester Water District for Years Applicable to Ms. Bartlett and Lubeck Public Service District for Years Applicable to Mr. Wolf from Figure 2, Shin 2011. ¹		
Year	Carla Bartlett Tupper Plains-Chester Water District	John Wolf Lubeck Public Service District
1983	0.17	
1984	0.17	
1985	0.19	
1986	0.20	
1987	0.24	
1988	0.29	
1989	0.23	
1990		
1991		
1992		
1993		
1994	0.29	
1995	0.44	
1996	0.33	
1997	0.47	
1998	0.74	
1999	0.85	1.98
2000	0.83	1.52
2001	0.50	0.69
2002	0.37	0.56
2003	0.23	0.29
2004	0.16	0.25
2005	0.12	0.26

¹ Shin H, VM Vieira, PB Ryan, R Detwiler, B Sanders, K Steenland, SM Bartell. 2011. Environmental fate and transport modeling for perfluorooctanoic acid emitted from the Washington Works facility in West Virginia. Environmental Science and Technology, 45:1435-1442. Concentrations shown in the table for the Lubeck Public Service District are values of “New Lubeck predicted” as reported in Figure 2.

Materials Relied On, Reviewed and/or Considered by Expert Dr. David MacIntosh

All materials referenced and/or discussed within the report are incorporated. In addition to the materials within the report, the other materials relied on, reviewed, and/or considered in the preparation of the expert report are as follows:

Depositions
Deposition Transcript of Carla Bartlett (6/18/2014), including all accompanying exhibits (<i>In re: E. I. Du Pont de Nemours & Company C-8 Personal Injury Litigation</i> , Case No. 2:13-md-2433; <i>Bartlett v. E. I. du Pont de Nemours and Company</i> , Case No. 2:13-cv-0170)
Deposition Transcript of John Wolf (6/12/2014), including all accompanying exhibits (<i>In re: E. I. Du Pont de Nemours & Company C-8 Personal Injury Litigation</i> , Case No. 2:13-md-2433; <i>Wolf v. E. I. du Pont de Nemours and Company</i> , Case No. 2:14-cv-0095)
Deposition Transcript of James Cox (3/30-31/2004), including all accompanying exhibits (<i>Leach v. E. I. Du Pont de Nemours and Company</i> , Civil Action No. 01-C-608)
Deposition Transcript of Donald Poole (4/27/2004), including all accompanying exhibits (<i>Leach v. E. I. Du Pont de Nemours and Company</i> , Civil Action No. 01-C-608)

Literature
Paustenbach, A methodology for estimating human exposure to perfluorooctanoic acid (PFOA): A retrospective exposure assessment of a community (1951-2003) (2006)
Bartell, Rate of decline in serum PFOA concentrations after granular activated carbon filtration at two public water systems in Ohio and West Virginia (2009)
Frisbee, The C8 Health Project: Design, Methods, and Participants (2009)
Steenland, Predictors of PFOA levels in a community surrounding a chemical plant (2009)
U.S. Department of Health & Human Services, Agency for Toxic Substances and Disease Registry, Draft Toxicological Profile for Perfluoroalkyls (May 2009)
Hoffman, Private drinking water wells as a source of exposure to perfluorooctanoic acid (PFOA) in communities surrounding a fluoropolymer production facility (2010)
Seals, Accumulation and clearance of perfluorooctanoic acid (PFOA) in current and former residents of an exposed community (2010)

Shin, Environmental fate and transport modeling for perfluorooctanoic acid emitted from the Washington Works Facility in West Virginia (2011)
Shin, Retrospective exposure estimation and predicted versus observed serum perfluorooctanoic acid concentrations for participants in the C8 Health Project (2011)
Mondal, Relationships of perfluorooctanoate and prefluorooctane sulfonate serum concentrations between child-mother pairs in a population with perfluorooctanoate exposure from drinking water (2012)
Shin, Modeling the air-soil transport pathway of perfluorooctanoic acid in the mid-Ohio Valley using linked air dispersion and vadose zone models (2012)
Woskie, Retrospective exposure assessment of perfluorooctanoic acid serum concentrations at a fluoropolymer manufacturing plant (2012)
Vieira, Assessing the spatial distribution of perfluorooctanoic acid exposure via public drinking water pipes using geographic information systems (2013)
Winqvist, Design, methods and population for a study of PFOA health effects among highly exposed Mid-Ohio Valley community residents and workers (2013)
Bartell, The impacts of exposure uncertainty on the reported association between perfluorooctanoate and preeclampsia (Abstract, We-O-C3-02)
Bettsz, PFOA and High Cholesterol: Basis for the Finding of a Probable Link (2014)
Screenshot of Publications Found from Search for "Enguage Digitizer" in 'Google Scholar'

Documents
Order Approving Final Settlement & Notice Plan and for Entry of Final Judgment (2/28/2005), <i>Leach v. E. I. Du Pont de Nemours and Company</i> , Civil Action No. 01-C-608 (Circuit Court of Wood County, West Virginia)
Class Action Settlement Agreement (11/17/2004) and Schedule 2.1.1(A), <i>Leach v. E. I. Du Pont de Nemours and Company</i> , Civil Action No. 01-C-608 (Circuit Court of Wood County, West Virginia)
5/22/2003 Letter from U.S. EPA to DuPont Haskell Laboratory re: TSCA 8(e) Reporting Requirements for PFOA Information
7/11/2003 Letter from DuPont Legal to U.S. EPA (Heftter) re: PFOA Drinking Water Monitoring Data & Attachments

9/2/2003 Letter from West Virginia Department of Environmental Protection (Watkins) to Perry McDaniel & Accompanying "GIST" Report
2008 Data Assessment Report - DuPont Washington Works & Appendix Data (OPPT-2004-0113 PFOA Site-Related Environmental Assessment Program), Project No. 507532/507533 (10/2/2008)
10/2/2012 Email from Kyle Steenland re: Science Panel Communication
C8 Science Panel, Probable Link Evaluation of Cancer (4/15/2012)
C8 Health Project Survey Introduction
Vieira, Geographic patterns of cancer study (PowerPoint)
C8 Science Panel Public Slide Presentation
Transcript of 5/18/2011 Status Conference, <i>Leach v. E. I. Du Pont de Nemours and Company</i> , Civil Action No. 01-C-608 (Circuit Court of Wood County, West Virginia)
C8 Health Panel Records for Carla Bartlett (Participant ID #63254)
Plaintiff Fact Sheets for Carla Bartlett (including amended/supplemental plaintiff fact sheets)
Property Record Card for Carla Bartlett (3933 Roadside Park Road, Athens County, Ohio; Parcel F010010024906)
Property Record Parcel for Carla Bartlett (21363 US Route 50, Athens, Ohio; Parcel F01-00100249-06)
Property Record Card for Carla Bartlett (2546 Lottridge Road, Athens County, Ohio; Parcel F010010040000)
Tuppers Plains-Chester Water District Records for Carla Bartlett (Service Addresses: 21363 US 50, Guysville, OH; 21365 US 50, Guysville, OH; "Trailer Behind Old DePoy"; 3933 Roadside Park Road)
Tuppers Plains-Chester Water District Records for Carla Bartlett, 11/18/2014 Letter re: Proof of Water Service with Tuppers Plains Chester Water District Tap #3182 (Service Address: 2540 Lottridge Road, Coolville, OH 45723)
Tuppers Plains Chester Water District Records for Carla Bartlett, 11/10/2014 Letter re: Proof of Water Service with Tuppers Plains Chester Water District (Service Address: 21357 US Rt 50, Guysville, OH 45735)
C8 Health Panel Records for John Wolf (Participant ID #2251)

Plaintiff Fact Sheet for John Wolf
Lubeck Public Service District Records for John Wolf (Property Location: 60 Wildwood Drive, Vienna, WV)
Lubeck Public Service District Records for John Wolf (Property Location: 19 East Wildwood Drive, Parkersburg, WV)
Location Map for Lubeck Public Service District and Project Areas (Exhibit 14A)
2000 Personal Tax Records for John Wolf (Address: 6 Wildwood Drive, Parkersburg, WV)
2000 Property Tax Records for John Wolf (Address: 66 Wildwood Drive, Parkersburg, WV)
Property Record/Parcel Information for John Wolf (Address: 60 Wildwood Drive, Wood County, WV)
Property Record/Parcel Information for John Wolf (Address: 263 Wildwood Drive, Wood County, WV)
Property Record/Parcel Information for John Wolf (Address: 19 E. Wildwood Drive, Wood County, WV)
Wood County 9-1-1 New Address Request Form for John Wolf (Current Address: 6A Wildwood Drive, Parkersburg, WV; New Address: 60 Wildwood Drive, Apt. 101, Parkersburg, WV)
Wood County 9-1-1 New Address Request Form for John Wolf (Current Address: 66 Wildwood Drive, Parkersburg, WV; New Address: 19E Wildwood Drive, Parkersburg, WV)